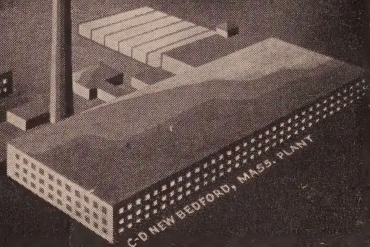
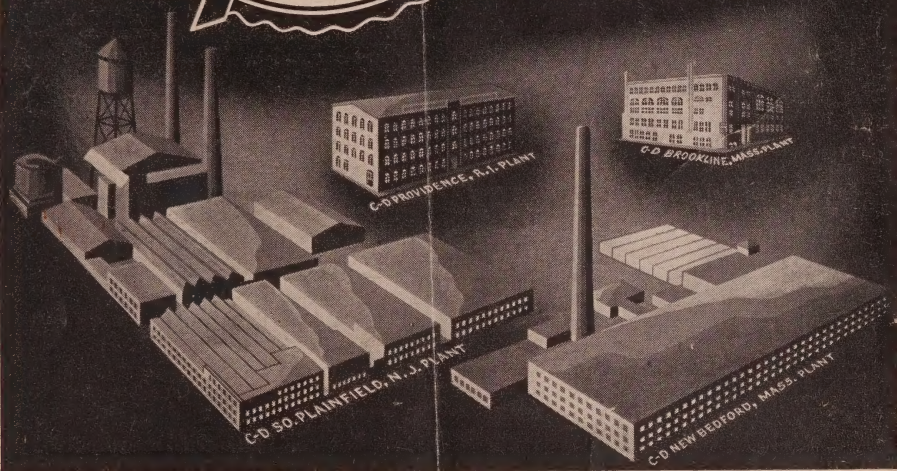


The CORNELL-DUBILIER Capacitor



Vol. 13

FEBRUARY, 1948

No. 2

CORNELL-DUBILIER ELECTRIC CORP.
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HOW TO BUILD A PORTABLE ELECTRONIC PHOTOFLASH

By W. G. MANY, Editor, C-D Capacitor

"Why is electronic speed photoflash equipment usually so heavy and cumbersome?" is a question frequently asked, and "why can't capacitors, transformers and batteries be made smaller size and lighter weight than they are at present for use in ultra compact portable equipment?" Proposals have even been made that a complete power and storage unit be contained in the handle of an average size flashgun.



The complete outfit ready for the flash.

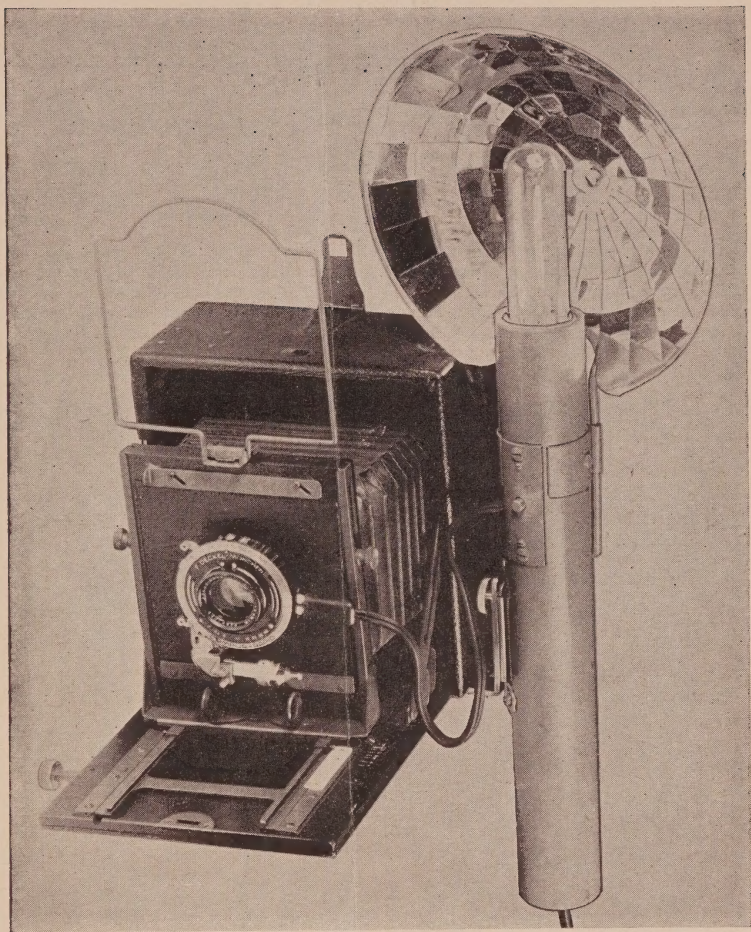
The only answer to these questions is, that undersize, underweight components for this service do not give the same measure of performance with

present-day types of flashtubes and circuits as do their larger and heavier counterparts. Energy storage capacitors of the type employed in photoflash equipment can, of course, be made considerably smaller in physical size for a given capacity and voltage rating but at either sacrifice in service life safety factor or loss of energy in discharge. Transformers and batteries also can be made smaller in size for comparative voltage ratings but are similarly not as efficient for photoflash use as larger and heavier units. Thus, generally speaking, the heavier the power pack the more power it puts out and the more light that can be had from the flashtube.

The semi-portable A.C. operated equipment described in the August 1947 issue was therefore built with the thought in mind to produce optimum light output from the one tube, yet be reasonably light, compact and practicable to build from parts readily available through nationwide radio parts distributors.

The portable outfit illustrated in the accompanying photos and diagrams shows a homemade battery operated speed photoflash unit which can also be built from standard parts, costing less than \$60.00 complete with flashgun and tubes, and requires little skill on the part of an experienced radio serviceman who has proper regard for work with high voltage circuits, as this equipment, like all other electronic photoflash devices, is DANGEROUS in the hands of those who are unfamiliar with high voltage radio or electrical circuits.

This equipment employs the same trigger circuit and flashtube gun handle assembly as described in the August



A close-up view of the Speed Graphic press camera showing how the gun assembly is attached with a bracket and connected to the terminals of the special built-in synchronizer on the side of the shutter. Also note the manual trip switch on the gun handle for testing. Firing for a "take" is initiated by setting the shutter and releasing in the usual manner with a cable release. The device on the lensboard below the shutter is an unused selenoid-type synchronizer employed with a flashbulb gun.

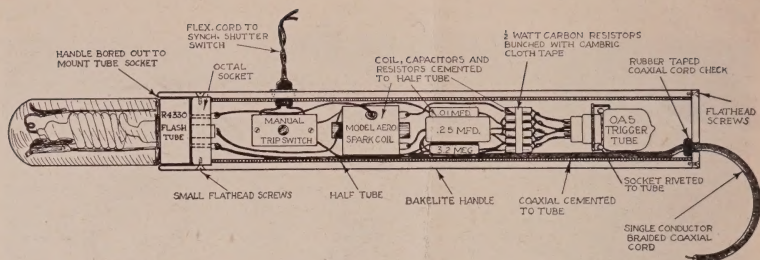
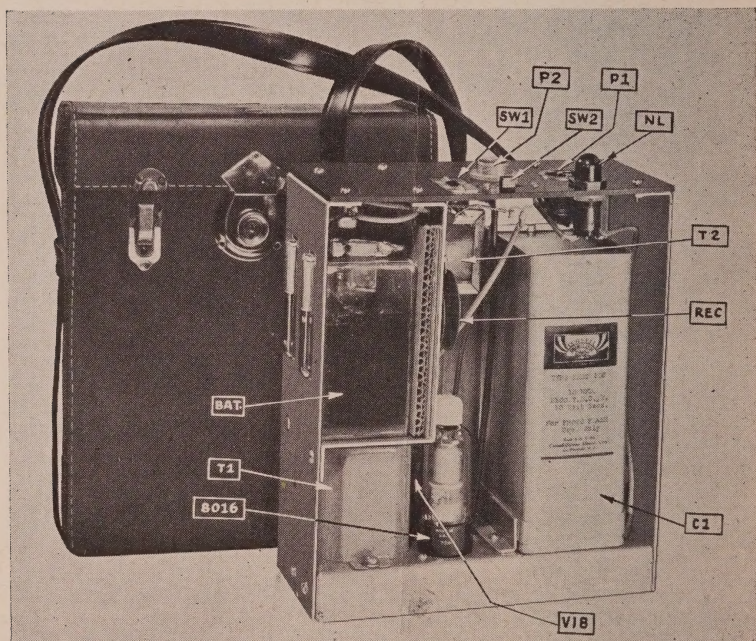
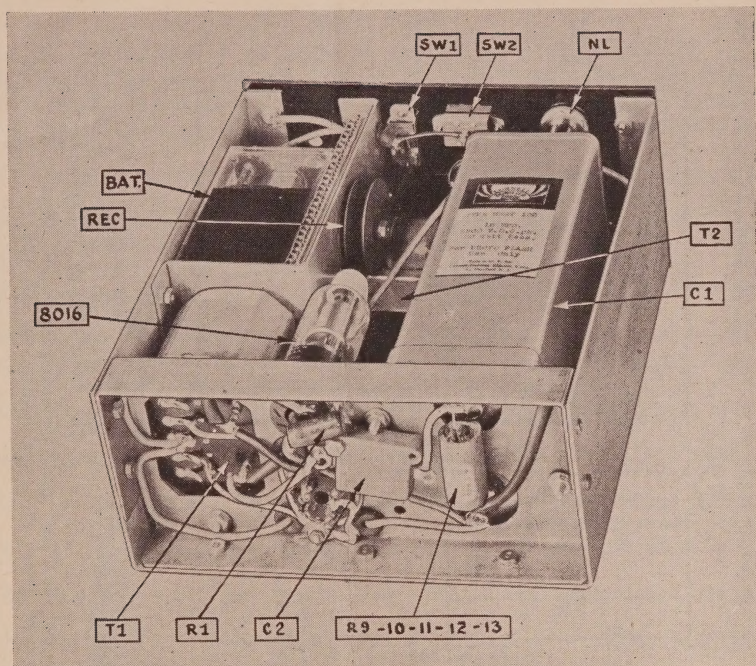


Fig. 1. Sketch showing the flash gun construction and layout of parts in a 1 1/8" I.D. bakelite tube handle. By removing the two screws in the octal socket and connections to the manual trip switch the entire assembly mounted in the half tube can be readily removed for inspection. Care must be taken to have high voltage leads well insulated and separated from ground and spark coil leads in order to prevent flash-overs.



The power unit removed from the camera carrying case exposes all parts for inspection or repairs. The small four-volt storage battery and charge indicators are seen in the compartment at the left.



A bottom view of the power unit showing the parts layout and wiring beneath the chassis base. All components are indicated to correspond with the wiring diagram in Fig. 2 and list of parts.

1947 issue and shown in the photos and diagrams herewith, only that a shorter, 4-foot length, of insulated single conductor and metallic braid coaxial cord is used. The bracket on the gun shown was adapted for mounting a 4" x 5" Speed Graphic camera, and a Mack Camera Service instantaneous synchronizer was specially built in the shutter with detachable cord connected to the gun.

A casing for the power unit is cut out of 1/16" sheet aluminum according to dimensions shown in Fig. 3 and bent in a vise as indicated in the illustrations. The chassis is made of light sheet steel 7-7/8" x 3-11/16" x 1", drilled and punched to mount the stor-

age capacitor and power transformer between which are mounted two tube sockets. One socket (4-prong) is employed for the 4-volt vibrator behind the rectifier tube.

The unit employs a built-in storage battery charger consisting of a 6-volt transformer and selenium rectifier assembly as shown in Fig. 2 which is mounted on the side of the battery compartment as seen in the photos. The Willard 4-volt storage battery is held in its compartment tightly with two pieces of corrugated board. Two holes are drilled in the top panel directly above the vent holes in the center of each cell of the battery. Keep cells

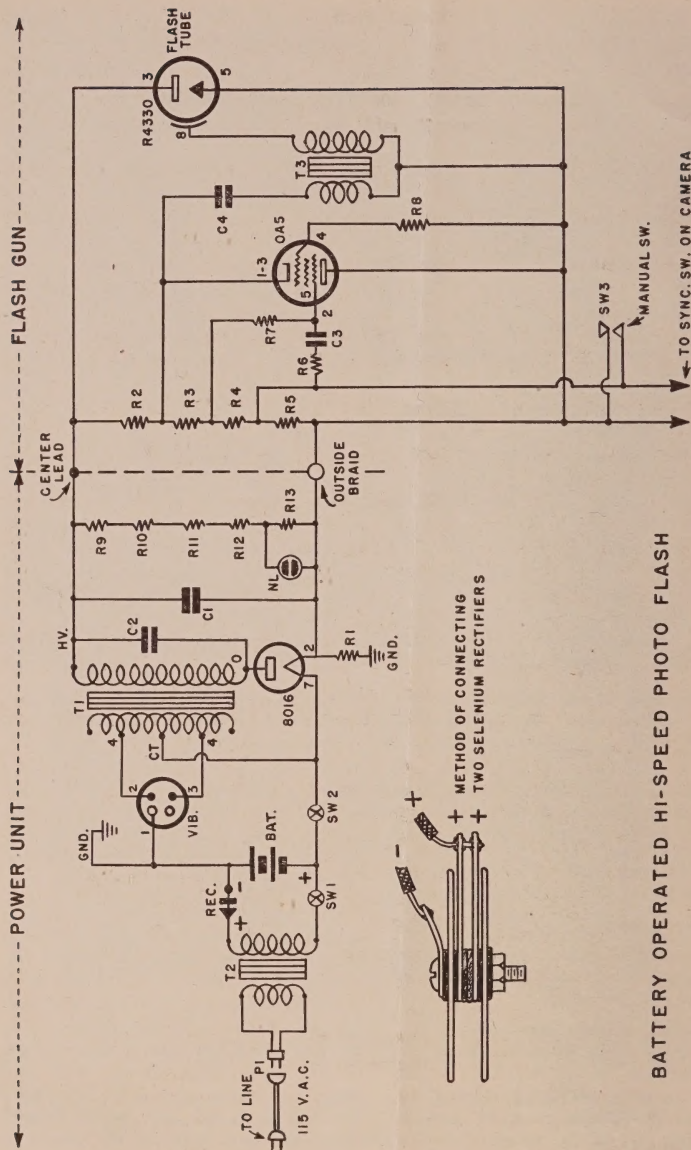


Fig. 2. Wiring diagram of the power unit and flash gun. All parts used in both power unit and flash gun shown in the accompanying photos are listed on the next page.

BATTERY OPERATED HI-SPEED PHOTO FLASH

List of Parts

- C1 Storage Capacitor, 15 mfd., 2500 V. Cornell-Dubilier type HKGT-1A02
- C2 Buffer Capacitor, .004 mfd., 2500 V.D.C. Cornell-Dubilier type 4-52040
- C3 Trigger Grid Capacitor, .01 mfd., 400 V.D.C. Cornell-Dubilier type DT-4S1
- C4 Anode Discharge Capacitor, .25 mfd., 400 V.D.C. Cornell-Dubilier type DT4P25
- T1 Power Transformer, Pri. 4 V. Sec. 2200 V. United Transformer Corp. type PF-2
- T2 Charger Transformer, Pri. 115 V. 50/50 cy. A.C. Sec. 6.3 V.-1.2A. U. T. C. type FT-2
- T3 Trigger Transformer, Model Aero Motor Ignition Coil, 15 KV. peak.
- R1 Filament Heater Resistor, 15 ohms, I.R.C. type AB 10W. wire-wound type resistor.
- R2 Voltage Divider Resistor, 3.2 meg. I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R3 Voltage Divider Resistor, 180,000 ohms I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R4 Voltage Divider Resistor, $\frac{3}{4}$ meg. ohms I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R5 Voltage Divider Resistor, 170,000 ohms I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R6 Sw. Cur. Limiting Resistor, $\frac{1}{4}$ meg. I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R7 Grid Current Limiting Resistor, 10 meg. I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R8 Keep-Alive Our. Lim. Res. 20 meg. I.R.C. carbon insulated-type resistor— $\frac{1}{2}$ W.
- R9, R10, R11, R12 Bleeder Resistor I.R.C., Four 1 meg. $\frac{1}{2}$ W. resistors in series.
- R13 Bleeder Resistor, $\frac{1}{2}$ meg.
- BAT. Storage Battery, 4 volts, Willard type ER64B.
- REC. Storage Battery, Charger Rectifier, Two Federal Telephone & Radio type 4D2814A
- SW1 & SW2 SPST slide-type switches.
- SW3 Manual Trip Switch, G.E. Miniature push-button type.
- N.L. Neon Lamp Charge indicator, G.E. type NE-51 (Bay.).
- VIB 4-volt interrupter-type four-prong base, vibrator.
- P1 110 V. midget cord connector Arrow MH and 8340 plug cap.
- P2 Coaxial panel receptacle, Amphenol type 93C with cable plug 93M
 $4\frac{1}{2}$ feet coaxial cord, Amphenol RG58/U
 1 four-prong tube socket, chassis mounting.
 1 octal tube socket, chassis mounting.
 1 H.V. octal socket, Amphenol type
 1 midget bayonet socket for neon lamp, panel mounting type.
 1 miniature 7-contact metal rim tube socket
 1 8016 rectifier tube
 1 Sylvania R4330 flashtube
 1 Sylvania OA5 trigger tube

get clips are employed on leads to the battery terminals.

Technical drawing of a battery compartment. The main view shows a rectangular box with a lid. Dimensions include a total width of 9 inches, a depth of 3 3/4 inches, and a height of 5 1/8 inches. The lid is hinged on the right side with a 90-degree bend. A notch at the top of the lid is 45 degrees and 3/4 inch wide. The front panel is 3 5/8 inches wide. A label "BATTERY COMPARTMENT" is shown on the front. A side view shows the lid with a 90-degree bend and a 3/4 inch notch. A detail view shows the lid with a 90-degree bend and a 3/4 inch notch. The material is specified as "MADE OF 1/16 THICK ALUMINUM".

NOTCH 45°

BEND 90°

3 3/4"

5 1/8"

3 5/8"

BATTERY COMPARTMENT

9"

3 3/4"

MADE OF 1/16 THICK ALUMINUM

CUT OUT HOLES FOR BATTERY CHARGE INDICATORS

11/16"

5/8"

1"

5/8"

13/16"

BEND 90°

3/4"

2 1/2"

8"

The left drawing shows the steel chassis with dimensions: 3 1/16" width, 1" height, and 1 1/8" depth. It features a 'HOLE FOR TRANSFORMER' at the rear, a 'CAPACITOR' at the front, and two circular components labeled '8016' and 'V.I.B.'. The right drawing shows the 'CASING ASSEMBLY' with a 'BATTERY COMPARTMENT' indicated by an arrow.

THE C-D CAPACITOR

To recharge the battery, a plug receptacle with cord is merely inserted in the small below-surface plug cap P1 on panel and connected to the 115 V. A.C. power line. Slide switch S1 is switched on to charge the battery at the rate of approximately a half an ampere. This is a trifle less than the recommended rate but, of course, more desirable for long lasting battery service. Complete charge is indicated when both balls in each cell indicator are floating to the top of the electrolyte.

The entire power supply unit shown weighs approximately ten pounds and fits into an old camera carrying case at one end of which two openings were cut out for the battery charge indicators to be viewed from the outside. However, the constructor can build his own carrying case from thin wood with a removable cover. It may either be covered with fabricoid or varnished bookbinders cloth to one's own liking, and provided with a shoulder carrying strap.

The operation of the unit is simple. After the coaxial cord connector is plugged in P2 of the power pack and locked with the screw ring, the slide switch SW2 is pushed on to start the vibrator and charge the capacitor. In about 15 seconds one element of the neon lamp will glow its brightest which

indicates that the capacitor is fully charged and ready for firing a flash. The manual trip switch on the gun handle can be employed for test purposes after which other charges are allowed to build up, in at least 15 to 20-second intervals, for repeated shots.

Among the apparent problems which seem to puzzle some photographers about electronic speed photoflash work is that of definite light output ratings of equipment. Although manufacturers of flashtubes give ratings for their tubes, light factors vary according to the tube used, applied voltage, type of reflector, etc. Therefore, there are few tables of light factors for various film speeds that can be expected to give accurate exposure data for all flash equipment. Once proper exposures are determined with your particular outfit, uniform and consistent results may be expected.

Therefore, for all intents and purposes, using most any of the popular panchromatic films, simply set your lens aperture wide open, shutter at its fastest speed, in order to cut out any effects of general lighting, and fire away. Let only the light from the flashtube be fully utilized for your subject. Smaller lens apertures may be determined by experiment.

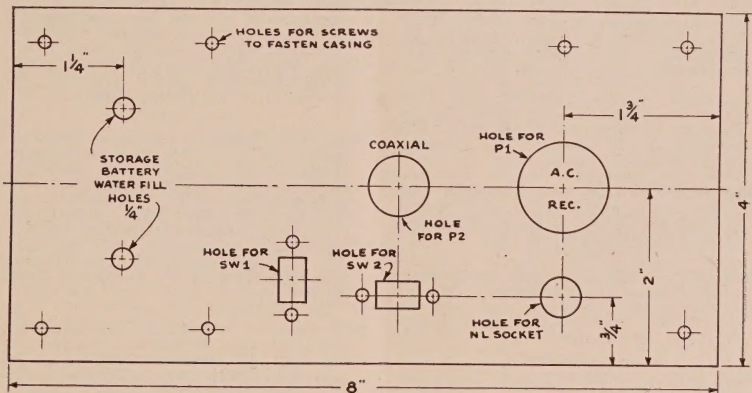


Fig. 4. The top panel is made of 1/8" bakelite according to the above dimensions.



A Free Market-Place for Buyers, Sellers, and Swappers.

These advertisements are listed FREE of charge to C-D readers so if there is anything you would like to buy or sell, if you wish to obtain a position or if you have a position to offer to C-D readers, just send in your ad.

These columns are open only to those who have a legitimate WANTED, SELL, or SWAP proposition to offer. The Cornell-Dubilier Electric Corp. reserves the right to edit advertisements submitted, and to refuse to run any which may be considered unsuitable. We shall endeavor to restrict the ads to legitimate offers but cannot assume any responsibility for the transaction involved.

*Please limit your ad to a maximum of 40 words, including name and address. Advertisements will be run as promptly as space limitations permit.

FOR SALE — Riders Manuals 6 through 14, \$135.00; Riders Record Changers \$7.00; Precision 912-P tube checker, \$50; Rider Chanalyzer, \$140. Manuals and equipment in excellent condition, will sell all or part; manuals all in one lot. The Radio Doctor, 520 Bank St., Wallace, Idaho.

FOR SALE — Webster-Chicago wire recorder, \$150, complete; Signal Corps wire recorder magazine, \$45. Write to Wire Recorder, Chicago & Vine, Arlington Heights, Ill.

FOR SALE — Bud, 6 prong plug in coils, set of 4. Range 11-210 meters \$2.50. Various numbers of used tubes. Want Riders Manuals 8, 9, and 10. Must be reasonable. Bill's Radio Service, 9937 S. Carpenter St., Chicago 43, Ill.

FOR SALE — Riders Manuals Vol. 1 to 10, in fine condition; also Riders Service Magazines. Make offer; all letters answered. L. W. Barton, 366 Windsor Ave., Wilson 5, Conn.

FOR SALE — Like new Stenotype Machine and instruction material. Reasonable Mr. Albert E. Golem, 17 Grove Terrace, Tanacoonda, N. Y.

WANTED — Will pay cash for German Luger Pistol with short barrel. Need not be in working condition, but must be intact. W. Printz, 1259 East 13th St., Brooklyn 30, N. Y.

FOR SALE — Hickok 510 X Tester for tubes and analyser. New condition, \$50. John E. Lorcaine, 211 Summer Ave., Newark 4, N. J.

WANTED — Used miniature gas motors. Please advise what you have on hand, also condition and your lowest price. Interested in some of the first motors placed on the market. Model Builders Guild, 81 Lawrence St., Hartford 6, Conn.

SELL OR TRADE — Converted BC 348-P, \$60; Unused Abbott TR-4, used DK-2, both with tubes, \$60; Speco STAP signal tracer, Supreme 502 Multimeter, SCR-522, etc. Trade for Panadaptor, Hickok Tracemeter, or what have you? E. S. Page, Box 239, Decatur, Ala.

TRADE — National Radio Institute correspondence course on Fundamental electronics, covering complete radio and television; over 60 lessons, good condition. Want tube tester or signal tracer. Write Armand's Radio Service, 669 Middle St., Fall River, Mass.

SALE OR TRADE — Seeburg amplifier with 2 14" speakers in cases; Kodak 16 mm. movie camera, A-1 condition, 22-50 ft. mag. of Kodakrome film; control heads for 41 & 40 Plymouth and Dodge. Large list tubes, meters and other items. Send for complete list and information on camera and amplifier. All inquiries answered. Leroy Smith Radio Service, R. D. 2, Beaver Falls, Pa.

FOR SALE — Professional syle Red-o-kut recording unit. Overhead recording mechanism with magnetic head. Cuts inside out, eighty lines per inch. Excellent condition, prewar model. Best offer. Mr. Dana Staker, 112 Commonwealth, Peoria 5, Ill.

WANTED — Complete or partial set of Riders Manuals. State price and condition. Reply to all letters received. Clarence Selz, 3316 Greenwood, Maplewood 17, Mo.

WANTED — RCA 1 kw. modulation transformer. Have miscellaneous tubes and parts to sell or trade. Eddie Howell, Gen. Del., Gastonia, N. C.

FOR SALE — Dumont Model 208-A Oscilloscope used slightly, excellent condition. Price, \$160, freight charges extra. Arendale Radio Service, 390 Van Dyke Ave., Haledon, N. J.

WANTED — Professional and semi-professional recording equipment. Send price and condition. Anthony L. Jakstys, 1462 Junction Ave., Detroit 9, Mich.

TRADE — Latest N.R.I. Course and N.R.I. Tester, less batteries, for used signal generator in working condition. Frank Wurst, 242 Dayton Ave., Clifton, N. J.

FOR SALE — Factory wired and aligned television i. f. containing both picture and sound channels. Postwar design using 2 6BA6's, 2 6AH6's, and 2 6AL5's. Price, \$32.50. Hartland B. Smith, 467 Park Ave., Birmingham, Mich.

TRADE OR SELL — Zenith record demonstrator, 5 tube 15 watt amplifier, phonomotor and table, 8 in. speaker, in original carton. Want BC-348 revamp Surplus transmitter, scope, what have you? All inquiries answered. Bill Rex, Odebolt, Iowa.

WANTED — Two Rola G. 12 Dynamic speakers, 1,000 ohms field with 500 ohms live transformers. Thompson Radio Electric Service, P. O. Box 330, Fayetteville, Tenn.

FOR SALE — RCA-Rider Chanalyst. Only slightly used. Price, \$100. Charles H. Dietrich, Alanson, Mich.

FOR SALE — Rider Chanalyst, Riders Manuals (1 to 5) 6 to 14; 920P tube and set tester; E200 signal generator; Solar C 1-60 Capacitor Analyzer, A.T.R. battery eliminator, 400 tubes in cartons. Price for all, \$675. Leon S. Schall, 158 Abbotts St., Plains, Pa.

WANTED — Used Signal Generator. Prefer Hickok model 288X or its equivalent. M. J. Whalen, 442 Lexington Ave., Youngstown, Ohio.

FOR SALE — Radios: Philco, Majestic, Brunswick, Holster, Colonial, and many others at low prices. Also power transformers. Send for bulletin. Goldstone Radio, 1279 Sheridan Ave., Bronx, N. Y.

WANTED — A 35mm. camera (Kodak, Argus, etc.). Will make good trade in radio parts or tubes for camera. P. Gurschwitz, 219 Herzl St., Brooklyn 12, N. Y.

SELL OR TRADE — Stewart Warner radio, 8 tubes, chassis and speaker, fine condition. Price, \$30 C.O.D., or will trade for FB7 Nat. SW in good condition, including 10 to 80 meter band spread coils, tubes, power supply, speaker. Frank Bou, c-o Bot. Dept. U. of Penn., 38 Woodland Ave., Philadelphia 4, Pa.

TRADE — NRL, VTVM, MARX electric train, crossing gate and signal light, and Christy appliance servicing course, in perfect condition, for Hickok 435 VOM, Triplet 625N VOM or Simpson 260 tester in good shape. John Simmons, P. O. Box 535, Salina, Kansas.

FOR SALE — Presto Model J Recorder. George Hoffman, 206 Division, Port Washington, Wis.

FOR SALE — Original Delux Vibroplex key, with jeweled bearings, 4 weights, wedge, and carrying case. Slightly used. Price, \$17. Robert H. Cushing, 12 Carver St., Plymouth, Mass.

SELL OR TRADE — Confidence model 36, tube-condenser-vibrator tester and Weston model 537 set tester. Want other test equipment, radio, camera, rifle or scope. J. W. Landon, Box 6425, Pittsburgh, Pa.

SELL OR TRADE — German military rifle, good condition. Want camera or Binoculars. Cash added. I have other German souvenirs. Please write to: George Lukes, 1321 So. Highland Ave., Bernyn, Ill.

TRADE — 16 mm. Bell & Howell telephoto lens, 3 inch, f 4. Telate, perfect condition. Signal generator must be main item in return, plus other items agreed upon. Jacob Goldfein, 65 Ft. Washington Ave., New York 32, N. Y.

WANTED — Kodak camera, F7 to F8 lens, pictures 2 1/4 x 3 1/4 in good condition. Cash or trade 5 tube table model radio, like new. H. E. Nordstrom, Oakhurst Radio Repair, Elma, Washington.

FOR SALE — Solar CE-1-60 condenser checker, like new, with leads and instruction manual, \$25; BC 612 5" Army oscilloscope, \$25; both, \$45. Porter Davis, 5859 Calumet Ave., Chicago, Ill.

WANTED — Converter, new or used, rotary preferred, convert 6 volt D.C. to 115 volt A.C. at 60 cycles. Must be capable of putting out at least 2 amperes of current. State price and condition. Norman Eide, 504 South Division St., Northfield, Minn.

FOR SALE — New Radio City Products Multimeter, Model 446A. Complete, \$17. All mail answered. Cecil Fernandez, Box 1453, St. Petersburg 1, Fla.

FOR SALE — 12" Quan PM speaker, like new, \$9; S.N.C. Universal output transformer, 10 watts, like new, \$1; two 8" speaker baffles (wood), good condition, \$2 each. Robert Britt, Iroquois No. 4-22, West Lafayette, Ind.

SWAP — Radio equipment or parts for postage stamp collection or accumulation. What have you and what do you need? B. Bernbaum, 5746 North Park Ave., Philadelphia 41, Pa.

FOR SALE — Several Supreme 504A tube and set testers, like new, \$60. Crystals in FT-243 holders—3525 KC, 3655 KC, 3825 KC, 3980 KC and 3995 KC—35 cents each. Send for bargain list. Murray Fisher, 4929 Old York Road, Philadelphia, Pa.

TRADE — Kalashen B-flat Wood Clarinet, complete with case and two extra mouthpieces. Guaranteed perfect. Want a VHF 152 converter, typewriter, low power phone rig, or what have you? All inquiries answered. R. J. Langiewicz, 625 East 13th St., Erie, Pa.

FOR SALE — Established radio repair shop. Location, Route 10 in business district. Net inventory, \$2,000. Good opportunity for sales department. Write for information on equipment and stock of supplies on hand. Greg's Radio Sales & Service, 762 Main St., Plantsville, Conn.

FOR SALE — RCA 156-B tube tester, pair telephonic headphones, telephonic mike, home-built 350 V. power supply, 35 popular tubes, band switches, plugs, jacks, etc., (30 pieces). Entire lot for \$85. H. Edward Jackson, 118 N. East St., Culpeper, Va.

FOR SALE — 100 W. Fone transmitter, \$75; BC 348 receiver, speaker and schematic, converted to 110 V., \$45; 40 W. 40 meter C. W. transmitter, \$25; 5" home-made scope, \$50; 3 blank BC610 chassis, \$3 ea.; large refrigeration compressor, \$25. Frank H. Carlson, New London, Iowa.

SALE OR TRADE — Practical Electrics, Radio Handbook, The Radio Amateur Handbook, Radio Operating Questions & Answers, Reference Data for Radio Engineers, four Handbooks. Want a one or two inch oscilloscope in good condition. A. Paul Rabito, 2835 Paris Ave., New Orleans, La.

FOR SALE — Nearly new Triplet tube tester model 1613, with case, \$47. All mail answered. Cecil Fernandez, Box 1453, St. Petersburg 1, Fla.

FOR SALE — Model A-200 signal generator, \$35; three tube phono amplifier, tubes and output trans., \$5; Precision 834 multimeter, good condition, \$20; Selenium rectifiers, 100 Ma., \$0.75 ea. P. Schwartzman, 1698 Vyse Avenue, New York 60, N. Y.

SELL OR TRADE — Hallicrafter AC DC S38 4 band radio, like new. Price, \$45 express paid. Springfield 22 single shot rifle, perfect, \$7.50 postpaid. John Moy, Box 169, Canal Station, New York 13, N. Y.

SALE OR TRADE — UTC audio filters for recording equipment. Also a limited stock of VI-C variable inductances. All units discounted 60%. Radio Communication Service, 4475 Myrtle St., San Diego 5, Calif.

FOR SALE — Following copies of Radio at 15 cents each, postpaid: Jan. 1938, March, May, June, July, Nov., Dec., 1939. QST magazines at same price, intermittently from 1927 to 1943. M. Shively, 3115 Ingham, Lansing 10, Mich.

SELL OR TRADE — New book entitled "Machine Shop Operation," by the American Technical Society, 1942. Price, \$4, or what have you in printing equipment? Robert H. Cushing, 12 Carver St., Plymouth, Mass.

WANTED — Zenith No. S-6402 tuning motor in good condition. A. P. Rabito, 2655 Canal St., New Orleans 19, La.

FOR SALE — Perfect copy of Ghirardi's Modern Radio Servicing. Price, \$3 postpaid. J. S. Nichols, 114 Acorn St., Box 2495, Bremerton, Wash.

FOR SALE — Five tube phonograph with bass and treble controls. Price, \$30. L. J. Dubuc, 212 So. Rendon, New Orleans, La.

SALE OR TRADE — UTC transformers at 60% discount. All in cartons. Send for list. Radio Communications Service, 4475 Myrtle St., San Diego 5, Calif.

FOR SALE — Triumph model 120 signal generator, \$20. Various radio handbooks and service manuals. Write for list. M. Shively, 3115 Ingham, Lansing 10, Mich.

FOR SALE — QST's, Jan. 1942 to March 1947, including 5 yearly leather binders, all in good condition. Make offer. J. Blumenstein, 99 Christopher Ave., Brooklyn 12, N. Y.

SELL OR SWAP — BC 348-R-RCVR converted to 110 AC, in fine condition. Will sell for \$50, or swap for Ham radio equipment. Have 803 Pentod tube also for trade, or sell for \$5. Tube in perfect condition. F.O.B. R. M. Novak, 500 W. Norwood Pl., Wihmar, Calif.

FOR SALE — Riders Chanalyst 162-C, used very little, \$150; Riders Manuals 1, 2, 3, 9, 10, in perfect condition, \$35. D. W. Forsmark, Palisade, Minn.

FOR SALE OR TRADE — 10" Deitzgen log duplex decitrig slide-rule with leather case. Perfect. Want Simpson 260 set tester or Supreme 542 multimeter or similar instrument. Will pay extra cash for good meter. Make an offer. Tom Steffen, 507 Campus, Pullman, Wash.

FOR SALE — FBXA, National power supply, 80, 40, meter coils; 20 meter coils homewound, \$40. Jerry Mirra, 4412 Hill Ave., Bronx, N. Y.

SELL OR TRADE — Pair Delco auto horns, Ohmite resistors, electrolytic condensers, paper condensers, G.E. motor. Write for additional information. Prefer amateur transmitting equipment. G. H. Varney, 2620 Armand Pl., St. Louis 4, Mo.

TRADE — Commercial art course, Hawaiian guitar course, Gordon tenor bango with case. Trade for test equipment. T. M. Zaidel, 25 Magnolia St., Newark 3, N. J.

FOR SALE — Power supply unit for calibrator unit. Like new with tubes, 350 v. d. c. at 200 ma., mounting case. Radio Communication Service, 4475 Myrtle St., San Diego 5, Calif.

SALE OR TRADE — Pair 8 x 24 Habicht binoculars with case, very good condition. Price, \$55. Also have complete DeForests Course. Want good used Hallicrafter receiver. H. F. Magee, Jr., Claremont, Va.

FOR SALE — 1948 edition, P. D. Colliers & Son, 10 Volume "Junior Classics" and 10 Volume "World Reference Encyclopedia." All still packed in original cartons. Excellent books for children in school. \$200 takes both editions. Radio Sales & Equipment Service, 613 Warren St., Dayton 9, Ohio.

FOR SALE — Complete first set of Howard W. Sam's Photo-Fact Service in binder, already indexed and filed. Will ship postpaid for \$15. J. C. Strickland, 2123 W. College St., Shreveport 31, La.

FOR SALE — Philco tube tester, testing equipment, other radio equipment, radio tubes. Some tubes at list, others at 60% discount. John Andrew, 740 Maple St., Bethlehem, Pa.

FOR SALE — Sylvania tube tester, type 140, like new. Price, \$60 plus postage. Also Riders Manuals 7, 8, 9, 12, 13, in very good condition. Each \$10 plus postage. Frank J. Polinski, Box 118, Warren, New York.

FOR SALE — Presto 8K professional dual speed recorder and play back unit complete with re-transcription table, \$400 F.O.B. Navy model 120 transmitter complete with power supply, \$60 F.O.B. G.E. BC375E phone CW transmitter, complete with all tuning units, \$50 F.O. B. Charles S. Robbins, Box 324, Gloversville, N. Y.

SALE — Weston 676 Tube Checker, good condition, \$5; Readrite 710 Analyzer, fair condition, \$5; Ghirardi's "Modern Radio Servicing" and "Radio Physics Course," excellent condition, \$3 each, both for \$5, shipping charges collect. Veto M. Twaska, 3321 W. Carson St., Pittsburgh 4, Pa.

FOR SALE — Radio servicing course, Howard Sams Photofact Folders, Radio Diagrams by Beitman. Other radio books free with purchase of one of the books on the list. Write for prices. Dan & Ted's Radio Shop, 4355 So. Honore, Chicago 9, Ill.

FOR SALE — Large quantity of tubes, condensers, volume controls, speakers, and many other radio parts, selling below jobber's cost. Every item guaranteed. Write for list. H. R. Berkowitz, 8 Pearl St., New Haven, Conn.

SELL OR TRADE — Three line cushion index Rubber Stamp \$70. Each additional line \$.20. For knob handle add \$.20, or trade for radio parts, tubes or books. J. T. Cookson, Lock Box 0, Puxico, Mo.

FOR SALE — Supreme tube tester, model 589, in good condition, \$35. Al Wunsch, Dial Radio Service, 775 Newark Ave., Jersey City 6, N. J.

FOR SALE — Precision Vacuum tube multi-range tester, series EV-10-S, almost new. Less cover, \$50. Robert L. George, Big Rock, Tenn.

FOR SALE — Hickok model 156 Traceometer, \$130, used very little; 5" scope, \$100; Vol. 1 and 2 of Sam's Photofact, \$28. Robert L. Batchelor, 36 Washington St., Canton, Pa.

FOR SALE — Complete radio stock, including Vol. of 10 radio manuals, up to date; 1A200 Sig. Geux; VTVM Hickok; CE Solar; small tools; press drills, bits, etc. Price, \$400. R. L. Howard Box 847, Caldwell, Idaho.

FOR SALE — Sprague Tel-Ohmike, like new; also Precision A.C.-D.C. volt-ohm Decibel Milliammeter, model 864. Michael J. Plesha, Box 1315, Keewatin, Minn.

FOR SALE — Surplus BC-654-A Receiver-Xmitter. Complete except for power supplies, accessories and receiver tubes. Transmitter complete with tubes and crystal. Best offer. Herbert Edelson, 48 Talcott St., New Britain, Conn.

FOR SALE — National Receiver, model NC-200. Chassis slightly cut to fit compartment, no cabinet. Excellent condition. Price, \$175; also used Pincor rotary converter, type 12 K-30, \$70. Edward D. Untermyer, Pres., Wallace St., Stamford, Conn.

FOR SALE — Step down auto transformer 230 v.a.c. to 115 v.a.c., rating 250 v.a. Like new, \$2.50; transmitting filter condenser, like new, \$4. Radio Communication Service, 4475 Myrtle St., San Diego 5, Calif.

WANTED — A small revolver, Rider's Manuals, signal generator, typewriter, amateur gear. Eddie Howell, Gen. Del., Gastonia, N. C.

TRADE — Three Bavaria German Beer Steins for radio instruments. Smith Radio Service, 132 S. 7th St., Steubenville, Ohio.

FOR SALE — RME-DB-20 Preselector, all new tubes, \$35; G.E. transformer, 110 V. 60 cycle, 15,000 volt, 30 mils., very husky, \$10. Joe Tucker, 866 East 48th St., Brooklyn 3, N. Y.

FOR SALE — S-36 Hallicrafter, fine shape; standard model, not surplus. Covers both F.M. bands, several television. F.O.B. Chicago, \$197.50. Paul H. Prokes, 9216 S. Menard Ave., Oak Lawn, Ill.

WANTED — January 1946 copy of "Electronics." Will pay copy price or trade anything of equal value. I may have that hard to get tube you need. John F. Loftis, 647 Coconut Drive, Fort Lauderdale, Fla.

WANTED — Television set in any condition. State price and condition. Frank J. Slabinak, 3206 S. Maple Ave., Brookfield, Ill.

POSITION WANTED — Man, 31, married, desires full time position as radio serviceman, vicinity of Los Angeles, Santa Monica or Venice, Calif. 8 years experience servicing home and car radios. Familiar with all types of test equipment. Have car and tools. Wally Dile, 2445 Glyndon Ave., Venice, Calif.

FOR SALE — Locally. Two white plastic table model radios, \$10 each. T. Popel, 1223 Elm Ave., Brooklyn 30, N. Y.

FOR SALE — Signal Corps S.C.R. 178 transmitter and modulator, in perfect operating condition. Made by DuMont. Price, \$17.50. Nicholas Bartholomew, R.F.D. 1, Box 265-J, New Brunswick, N. J.

FOR SALE — Hallicrafters S-40 receiver in A-1 condition. Covers 540 Kc.-43 Meg. Price, \$70. George A. Gould, 1695 East 21st St., Brooklyn 29, N. Y.

SWAP — Radio News from August, 1945, to December, 1946, and Service Magazines. Would like to trade for Radio Operating Questions and Answers or any other communication books. Kurt Gramlich, 341 Knickerbocker Ave., Brooklyn 21, N. Y.

TRADE — National Radio Institute Correspondence course in radio, for a test instrument or radio parts or tubes. J. Clifton Shears, Radiotician, Cresaptown, Md.

FOR SALE — Model 140 Sylvania Tube Tester, \$75; Solar Exameter, \$55, like new; Reinco Dynamic tracer, good condition, \$45; Sam's Photo Facts, 1 through 21 with binders, \$35. Joseph Wunderlich, 236 W. Brooks, Galesburg, Ill.

FOR SALE — Complete N.R.I. Course; 5 tube radio; books and many radio and technical magazines. All for \$100. Write for complete list. Ronald Brock, R.F.D. 1, Box 232, Hazelgreen, Ala.

FOR SALE — Janette Converter, A-1 condition, built in filter. Price, \$35. R. L. Patterson, 104 Carlton Ave., Brooklyn 1, N. Y.

TRADE — Bruning-Wallace drafting machine with 360 degree protractor, complete with scales and accessories, all in 9 1/2 x 3 3/4 wooden case. Trade for signal generator. Larry MacDonald, 3929 Maquoketa Dr., Des Moines 11, Iowa.

FOR SALE — 124 issues of Q.S.T. from Jan., 1934, to August, 1945. Want movie equipment. Max Pearlman, c-o Macklen Radio, 2246 Ocean Ave., Brooklyn 29, N. Y.

FOR SALE — RME-69 receiver. Complete with tubes and X'tal filter, less speaker. Good condition, \$68. Also have transmitter for sale. Write for additional information. Bud Resch, Jr., 1214 W. Maple Ave., Independence, Mo.

FOR SALE — RCP analyzer BC-1052-F in original carton. Price, \$27.50. J. Gold, 344 Ft. Washington Ave., New York 33, N. Y.

SALE OR SWAP — Back issues of Radio News, various magazines on sports and hunting, and chemistry equipment, etc. All letters answered. Raymond H. Ives, 822 Windsor Ave., Norfolk 4, Va.

FOR SALE — Radio parts, tubes, speakers, 1, 2, and 3 tube phono-amplifiers for immediate delivery. Carl Brown, 167-04 111th Ave., Jamaica 5, N. Y.

FOR SALE — BC412-B Oscilloscope, re-converted, \$60 F.O.B. Chicago, Ill. W. Wilkes, 4122 Ozark Ave., Chicago 34, Ill.

WANTED — Items for Army Transmitter BC-223-AX. Dynamotor unit PE-55, control box BC-321, plugs PL-149 and PL-150. Also instruction book for BC-348-Q. Wm. Hansen, 165 Silverbrook Ave., Niles, Mich.

FOR SALE — BC-348 receiver converted for 110 A.C., \$55; BC-545 receiver with dynamotor, less tubes, \$4; 70 Mil., 28-270 V. dynamotor, \$3. BC-348 conversions made. E. G. Schwartz, 134 Weber St., Havre De Grace, Md.

WANTED — Hawaiian guitar, electric or non-electric. Also want spring wound phono-motor. All letters answered. Madell Reynolds, Route 1, Granville, Tenn.

FOR SALE — Five experimental kits. All parts like new. Tubes, sockets, chassis, 5 manuals, one earphone included. All five for \$10. Meter, \$10 extra with test leads, tube and batteries. Dan & Ted's Radio Shop, 4355 So. Honore, Chicago 9, Ill.

POSITION WANTED — Young man, 26, would like employment as Radio Technician or Serviceman in or around New York City. 5 years experience. Will accept position as radio salesman. John Muise, Jr., 19 Hancock St., Gloucester, Mass.

WANTED — CCI-60 Solar condenser analyzer or other similar instrument. Also signal tracer. Will swap whatever you need or pay cash. Have D.C. to A.C. inverter in excellent condition. Ed. Delzenski, 99 No. Spring St., Bloomfield, N. J.

FOR SALE — S-20R receiver, Navy scope Ts-34AP, SCR-1072-A 100W transmitter, Simpson O-1, 5" meter, Electrovoice dynamic 640 mike, tubes. Need late model tube tester. F. A. Paul, 5441 1/2 Hollywood Blvd., Los Angeles 27, Calif.

FOR SALE — Tubes, at 50-80% discount, speakers, other radio supplies. Write for catalog. M. H. Sable, Commercial Radio, 36 Brattle St., Boston, Mass.

SELL OR SWAP — Mossburg .22 cal. rifle with cleaning equipment and five boxes of cartridges. Want good Philco model 030 signal tracer, or equivalent, or \$22. Rifle in original box. Evan Lindner, 405 75th St., North Bergen, N. J.

FOR SALE — Model 900 Vomax and model 314 Radio City tube tester, both like new, \$40 each. Will sell separately or together, C.O.D. Also N.R.I. Course for \$10. El. Grimshaw, 174 Water St., No. Andover, Mass.

FOR SALE — Latest juke box records, A-1 condition, 10 cents each. Minimum order: 50, F.O.B. Sheboygan Radio, 2314 N. 15th, Sheboygan, Wis.

FOR SALE — Vibrapack, completely shielded, built in hash filter. Complete with extra vibrator, good condition, \$4.85 prepaid. Paul H. Prokes, 9216 S. Menard Ave., Oak Lawn, Ill.

WANTED — Position. 5 years radio service, 19 years motion picture work. Consider giving 30 hours a week for television, either building or repairs. Salary secondary. George Warshower, 586 Remsen Ave., Brooklyn, N. Y.

FOR SALE — 12 in. RCA television tube 12AP4, slightly used. Will demonstrate tube to prospective buyer. Price, \$20. H. Bergh, 1583 E. 96th St., Brooklyn 12, N. Y.

WANTED — Small, hand operated adding machine, Victor, Corona, or similar make. State age, condition, and price. C. E. Brickley, Farmland, Ind.

FOR SALE — Pilot FM tuner, five tubes, with selenium rectifier and built in antenna. Price, \$35. Wendell Plum, 313 Emily St., Mt. Morris, Ill.

FOR SALE — Hickok 203, perfect, \$70; Silver 904, perfect, \$39.50; two duplicators, letter size, \$20. John Sporna, Sporna Radio Service, Escatawpa, Ala.

SELL OR TRADE — Crystals, FT-241-A (for SCR-608), cheap; also slightly used 35 mm. Mercury II camera, coated lenses, \$69. Marvin Sims, 1724 So. 13th, Lawton, Okla.

SELL OR TRADE — Send for list of instruments, laboratory supplies, electrical supplies, photographic accessories to trade. Philip More, 4800 North Lawn-dale, Chicago 25, Ill.

SELL OR TRADE — Neon Display Products, electric clock; electrolytic and paper condenser assortment. Want 12" speakers with 3 lb. PM magnets and 1 1/4" voice coils, in horn baffles. W. S. Crooks, General Delivery, Kent, Ohio.

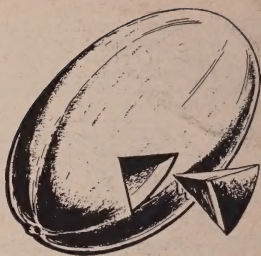
WANTED — Short wave Diathermy Machine; also Electrolysis Machine. Must be reasonable. Mortimer Rossheim, P. O. Box 542, Waukegan, Ill.

FOR SALE — IRC gold and silver band resistors, assorted resistance values, 75 for \$1, mostly one watt size. Also have 75 pilot light bulbs in bulk. No. 44, \$3. J. S. Tokarz, 1546 Riverside Ave., Somerset Centre, Mass.

FOR SALE — Hand-wound, spring driven, governor controlled, variable speed phono-motor and 12" turntable, removed from "Columbia" phonograph. In good operating condition, \$5 plus shipping charges. Gabriel Novick, 768 Rockaway Ave., Brooklyn 12, N. Y.

a "plug"

from our good friend,
the C-D serviceman...



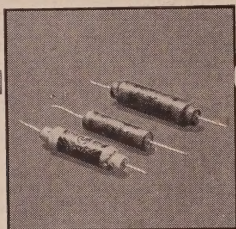
FRANK W. BECKMAN of Oakland, California writes why he cuts a bigger slice of service business



Says Frank: *"I really get a big kick out of . . . 'The Capacitor' . . . I have been using your products since about 1928 and I have yet to get one back. You really have something in your products and it only takes one look to tell a Serviceman which is best."*

Says C-D: We got a big kick out of your letter, too, Frank. It's like we've always been saying — C-D's got 'em all licked for quality and dependability. Many thanks.

"These C-D capacitors came out of old TRF sets . . . still good," says Frank W. Beckman, California serviceman.



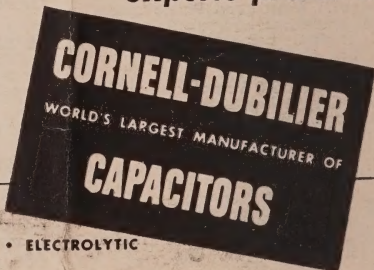
it's easy to see —
experts prefer C-D

1910



1948

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For your nearest authorized C-D distributor, consult your local Classified Telephone Directory

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